① $p = ?$

Data $m = 1600\ kg$

$v = 80\ m/s\ W$

eq $\Rightarrow p = mv$

Sub $\Rightarrow p = (1600\ kg)(80\ m/s\ W)$

$p = 128{,}000\ \underline{kg}\ \underline{m/s}\ \underline{W}$

(2.) $v = ?$

$m = 75\ kg$

$p = 185\ kg\ m/s$ South

$p = mv$

$$\frac{185\ kg\ m/s\ South}{75\ kg} = \frac{(75\ kg)(v)}{75\ kg}$$

$$v = 2.47\ m/s\ South$$

(3) $v = ?$

data $m = .004\,kg$

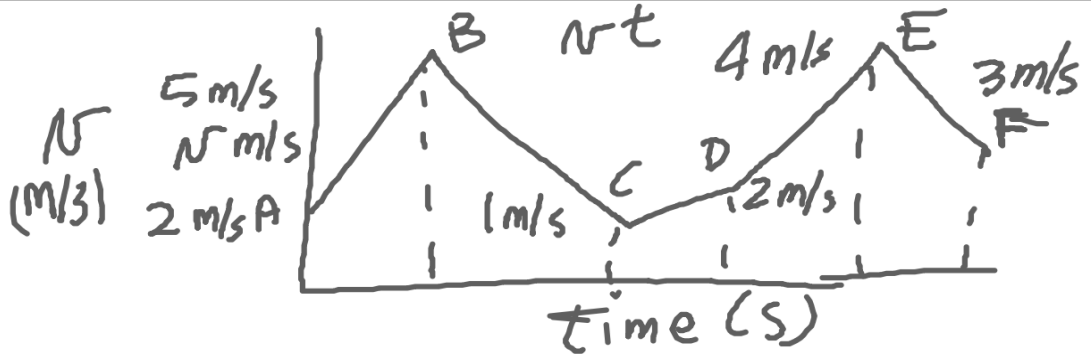
$p = 3.86\,kg\,m/s\,W$

eq $p = mv$

sub) $\frac{3.86\,kg\,m/s\,W}{.004\,kg} = \frac{(.004\,kg)v}{.004\,kg}$

$v = 965\,m/s\,W$

4a



A)

GIVEN: $p = ?$, $m = 70\,kg$, $v = 2\,m/s \downarrow$

Eq: $p = mv$

$p = (70\,kg)(2\,m/s \downarrow)$

$p = 140\,kg\,m/s \downarrow$

B)

$v = 5\,m/s \downarrow$

$p = ?$

$m = 70\,kg$

$p = mv$

$p = (70\,kg)(5\,m/s \downarrow)$

$p = 350\,kg\,m/s \downarrow$

4C)

$v = 1\ m/s$

$m = 70\ kg$

$p = ?$

$p = mv$

$p = (70\ kg)(1\ m/s \downarrow)$

$p = 70\ kg\ m/s \downarrow$

4D)

$v = 2\ m/s \downarrow$

$m = 70\ kg$

$p = ?$

$p = mv$

$p = (70\ kg)(2\ m/s \downarrow)$

$p = 140\ kg\ m/s \downarrow$

4E)

$m = 70\,kg$

$p = ?$

$v = 4\,m/s \downarrow$

$p = mv$

$p = (70\,kg)(4\,m/s \downarrow)$

$p = 280\,kg\,m/s \downarrow$

4F)

$m = 70\,kg$

$v = 3\,m/s \downarrow$

$p = ?$

$p = mv$

$p = (70\,kg)(3\,m/s \downarrow)$

$p = 210\,kg\,m/s \downarrow$

5. $p = ?$

$m = 8\,kg$

$v = 2\,m/s\,W$

$p = mv$

$= (8\,kg)(2\,m/s\,W)$

$p = 16\,kg\,m/s\,West$

6. $v = ?$
$m = 55\,kg$
$p = 185\,kg\,m/s$ South

$p = mv$

$$\frac{185\,kg\,m/s\ South}{55\,kg} = \frac{(55\,kg)(v)}{55\,kg}$$

$v = 3.36\,m/s$ South

7)

$$P_{RB} = P_{LB}$$

$m_{RB} = 100kg$ $\quad$ $m_{LB} = 160kg$

$v_{RB} = ?$ $\quad$ $v_{LB} = 5m/s\ W$

$$P_{LB} = (m_{RB})(v_{RB}) = (m_{LB})(v_{LB})$$

$$\frac{(100kg)(v_{RB})}{100kg} = \frac{(160kg)(5m/s\ W)}{100kg}$$

$$v_{RB} = 8m/s\ E$$

8)

$P_m = P_F$

$m_m = 80\,kg$
$v_m = ?$
$P_m = 600\,kg\,m/s\,W$

$m_f = 60\,kg$
$v_f = 10\,m/s\,E$
$P_f = m_f v_f$
$= 600\,kg\,m/s\,E$

$P_m = m_m v_m = \frac{(80\,kg)(v_m)}{80\,kg} = \frac{600\,kg\,m/s\,W}{80\,kg}$

$v_m = 7.5\,m/s\,W$

ALT $m_M v_m = m_F v_F$

9) Lowest momentum ⟹ Highest momentum

$p = m v^{1}$

$p = m$ When mass ↑ then p ↑

A	motorcycle	2
B	mountain bike	1
C	School Bus	4
D	Hummer H3	3
E	TRACTOR TRAILER	5

B A D C E

9) ALL
P = SAME
$p = mv$ (1)

$\frac{1}{m} = \frac{mv}{m}$

$v = \frac{1}{m}$

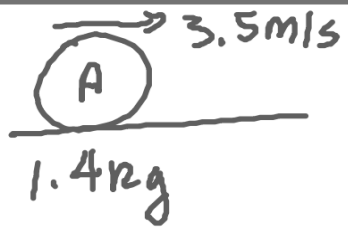
Lowest v to Highest Δx

Inversely Proportional

When $m \uparrow$ then $v \downarrow$

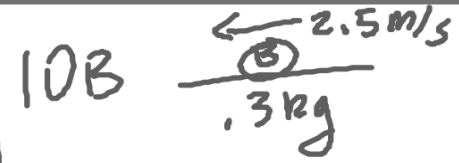
A Motorcycle
B Bike
C Schoolbus
D Hummer H3
E Tractor Trailer

E	C	D	A	B
Lowest v				Highest v

10A 

$m = 1.4\,kg$
$v = 3.5\,m/s$ Right
$p = ?$

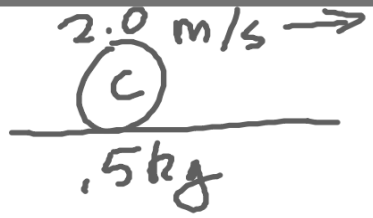
$p = mv$
$p = (1.4\,kg)(3.5\,m/s\ R)$
$p = 4.9\,kg\,m/s$ Right

10B 

$m = .3\,kg$
$v = 2.5\,m/s$ Left
$p = ?$

$p = mv$
$p = (.3\,kg)(2.5\,m/s)$
$p = .75\,kg\,m/s$ Left

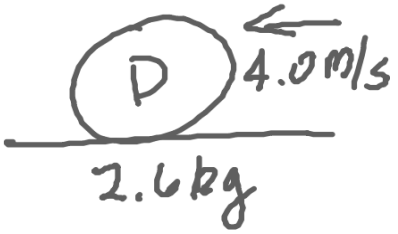
10 C



$m = .5\,kg$
$v = 2.0\,m/s$ Right+
$p = ?$

$p = mv$
$= (.5\,kg)(2.0\,m/s\ \text{Right+})$
$p = 1.0\,m/s$ Right+

10 D



$m = 2.6\,kg$
$v = 4.0\,m/s$ Left+
$p = ?$

$p = mv$
$p = (2.6\,kg)(4.0\,m/s\ L)$
$p = 10.4\,kg\,m/s\ L$

11. The momentum of the lunar vehicle will be the same on both the earth and on the moon. This is because momentum is EQUAL to MASS TIMES velocity, BOTH of which are the same IN Both LOCATIONS.

$m_{SC} = 1000\,kg$

$v_{SC} = ?$

$m_F = 3100\,kg$

$v_F = 8\,km/h\,N$

$$P_{SC} = P_F$$

$$(m_{SC})(v_{SC}) = (m_F)(v_F)$$

$$\frac{(1000\,kg)(v_{SC})}{1000\,kg} = \frac{(3100\,kg)(8\,km/h\,N)}{1000\,kg}$$

$$v_{SC} = 24.8\,km/h\,S$$